

CLAIMS

What is claimed is:

1. A method of identifying hematopoietic stem cells, comprising
 - a) targeting two different reporter DNAs into two different functionally
5 important genomic loci of hematopoietic stem cells in such a manner that expression of the reporter DNA is driven by the promoter of the genomic locus into which the reporter DNA is targeted, thereby producing a population comprising successfully targeted hematopoietic stem cells and other cells; and
 - 10 b) subjecting the population of cells produced in (a) to conditions under which successfully targeted hematopoietic stem cells survive and the other cells in the population do not survive, thereby identifying hematopoietic stem cells.
2. The method of Claim 1, wherein the hematopoietic stem cells are mouse cells or
15 human cells.
3. The method of Claim 1 wherein the two different functionally important genomic loci of hematopoietic stem cells are the Stem Cell Leukemia (SCL) locus and the Ikaros locus.
4. The method of Claim 1 further comprising c) isolating the hematopoietic stem
20 cells.
5. A method of identifying hematopoietic stem cells, comprising
 - a) targeting a first reporter DNA into a Stem Cell Leukemia (SCL) locus and a second reporter DNA which is different from the first reporter

- 5 DNA into an Ikaros locus of hematopoietic stem cells in such a manner that expression of the first reporter DNA is driven by the promoter of the SCL locus and expression of the second reporter DNA is driven by the promoter of the Ikaros locus, thereby producing a population comprising successfully targeted hematopoietic stem cells and other cells; and
- b) 5 subjecting the population of cells produced in (a) to conditions under which successfully targeted hematopoietic stem cells survive and the other cells in the population do not survive, thereby identifying hematopoietic stem cells.
- 10 6. The method of Claim 5, wherein the hematopoietic stem cells are mouse cells or human cells.
7. The method of Claim 5 further comprising c) isolating the hematopoietic stem cells.
8. The method of Claim 5 wherein the first reporter DNA is a huCD4/IRES/puro construct and the second reporter DNA is a β neo(lacZneo) construct.
- 15 9. Isolated hematopoietic stem cells produced by the method of Claim 4.
10. Isolated hematopoietic stem cells produced by the method of Claim 7.
11. Isolated hematopoietic stem cells comprising two different reporter DNAs which are present in two different functionally important genomic loci of the hematopoietic stem cells, wherein expression of the reporter DNAs is driven by the promoters of the genomic loci into which the reporter DNAs are targeted.
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12. The isolated hematopoietic stem cells of Claim 12, wherein the hematopoietic stem cells are mouse cells or human cells.
13. The isolated hematopoietic stem cells of Claim 12 wherein the two different functionally important genomic loci of hematopoietic stem cells are the Stem
5 Cell Leukemia (SCL) locus and the Ikaros locus.
14. Isolated hematopoietic stem cells comprising a first reporter DNA which is present in a Stem Cell Leukemia (SCL) genomic locus of the hematopoietic stem cells and a second reporter DNA which is different from the first reporter DNA and which is present in an Ikaros genomic locus of the hematopoietic stem
10 cells, wherein expression of the first reporter DNA is driven by the promoter of the SCL locus and expression of the second reporter DNA is driven by the promoter of the Ikaros locus.
15. The isolated hematopoietic stem cells of Claim 14, wherein the hematopoietic stem cells are mouse cells or human cells.
- 15 16. The isolated hematopoietic stem cells of Claim 14 wherein the first reporter DNA is a huCD4/IRES/puro construct and the second reporter DNA is a β neo(lacZneo) construct.